

Safety Note 13

CAUSES OF RECORDABLE INJURIES AT FERMILAB 1982 - 1985

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January 1986

During the period 1982-1985, Fermilab and its contractors had 189 recordable injuries and illnesses. This report analyzes those cases in an effort to identify trends which may be useful in preventing future accidents.

The index used to interpret the severity of accidents is "TOTPTS," which is approximately equal to the total costs associated with the injuries and illnesses (see SSDC-7A):

$$\text{TOTPTS} = D + T + \text{LWC} + \text{WDL} + \text{WDLR} + \text{NFC},$$

where

D = number of fatalities x \$250,000

T = number of transfers or terminations x \$100,000

LWC = number of lost workday cases x \$2,500

WDL = number of lost workdays x \$200

WDLR = number of restricted workdays x \$25

NFC = number of nonfatal cases w/o WDL or WDLR x \$500

TOTPTS were summed across accident types and body parts using the database maintained by the Safety Section. Case narratives were examined within accident types to identify subcategories.

The sum of TOTPTS for all recordable cases over the four year period is 513,825. The attached tables show how costs were distributed by accident type and subcategory. SLIP had the greatest fraction of the TOTPTS with 34.0%. The top three kinds of SLIPS were "slip on icy surface," "fall from one level to another," and "slip on wet surface." STRU had 31.8% with "object falls onto person" accounting for 1/2 the TOTPTS within this accident type. This includes large loads dropped from cranes as well as small objects falling from benches. OVER accounted for 17.0%, with back injuries being the most important subcategory at 14.3%. CAUT had 7.2%, with hands being the most frequent site of injury. CHEM represented only 4.7% of the costs with skin and eye injuries occurring most frequently. In most cases, the

injuries were caused by direct contact with a liquid due to the absence of personal protective equipment. CUTS had only 1.8% of the total.

The attached figure shows the distribution of TOTPTS over the part of the body affected. The back had the greatest loss with 27.4% of the total. Nearly as many back injuries were caused by falls as by overexertion. Other important sites of injury were legs (9.5%), feet (8.2%), eyes (6.8%), fingers (6.6%), and ankles (5.7%).

It is possible to sum over large areas of the body to get a general idea of where injuries occur. The whole torso has 41%, the whole legs 28%, the whole arms 20%, and the whole head 11%. Another interesting trend can be identified by looking at the losses as a function of location on the arms or legs. In both cases, the rates tend to be highest at the ends then decrease as you get closer to the torso. Toes are lower, which may be due to the use of safety shoes.

Areas which may deserve greater attention are those which had the larger fractions of TOTPTS. In particular, the following problems appear worthy of emphasis:

Back Injuries

They account for over 1/4 of the losses. Attention should be given to slips as well as overexertion.

Slip Accidents

They account for over 1/3 of the losses. Watch for icy and wet surfaces as well as work at heights.

STRU Accidents

They account for nearly 1/3 of the TOTPTS. Be careful for things falling on people, especially large loads which need to be moved with cranes.

SLIPS

	TOTPTS	FRACTION
Slip on icy surface	46,950	9.1%
Fall from one level to another	44,625	8.7%
Slip on wet surface	26,000	5.1%
Other slip	16,275	3.2%
Trip over object	15,625	3.0%
Mis-step on uneven surface	13,925	2.7%
Other mis-step	11,200	2.2%
	<hr/> 174,600	<hr/> 34.0%

STRU

	TOTPTS	FRACTION
Object falls onto person	80,575	15.7%
Other struck	41,850	8.1%
Person strikes object	28,475	5.5%
Foreign object in eye	12,700	2.5%
	<hr/> 163,600	<hr/> 31.8%

OVER

	TOTPTS	FRACTION
Back	73,725	14.3%
Other	13,775	2.7%
	<hr/> 87,500	<hr/> 17.0%

CAUT

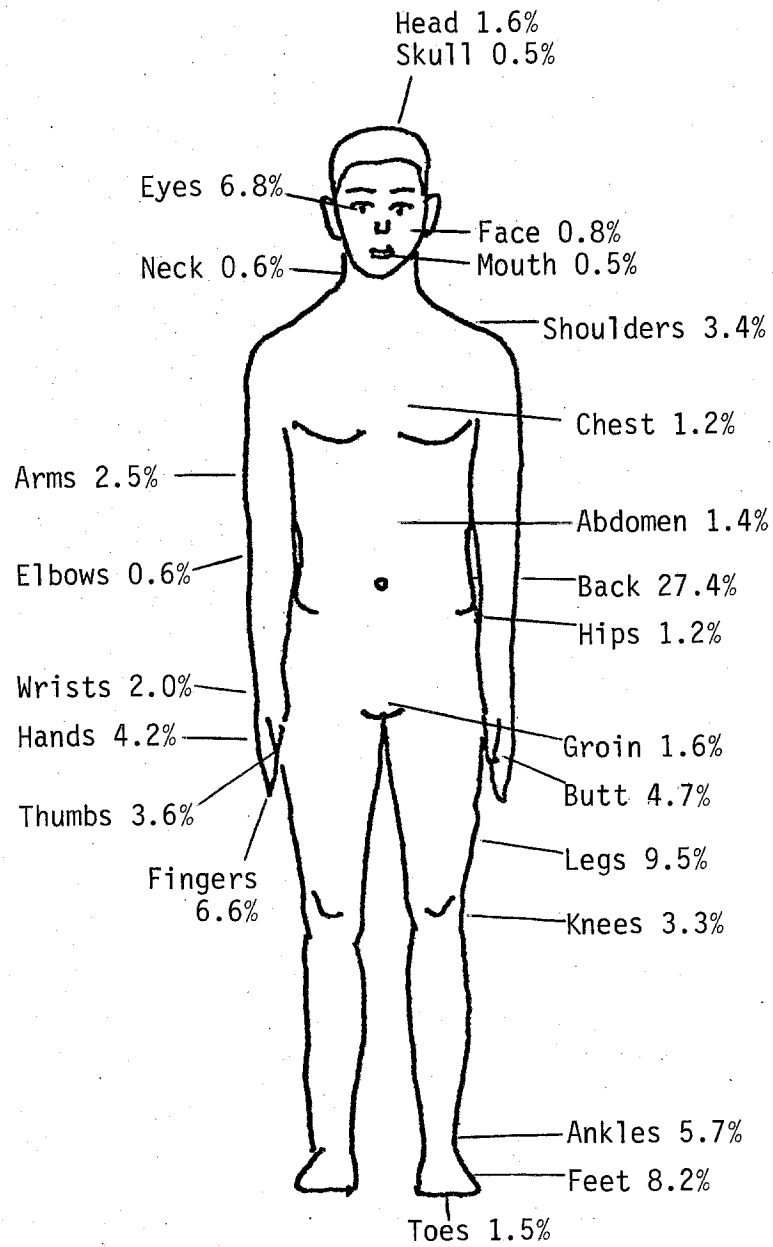
	TOTPTS	FRACTION
Finger, thumb, hand, wrist	27,600	5.4%
Leg, toe	9,300	1.8%
	<hr/> 36,900	<hr/> 7.2%

CHEM

	TOTPTS	FRACTION
Dermatitis	15,300	3.0%
Eye irritation	8,100	1.6%
Other	1,000	1.0%
	<hr/> 24,400	<hr/> 4.7%

CUTS

	TOTPTS	FRACTION
Finger, thumb, hand, wrist	8,550	1.7%
Back	500	0.1%
	<hr/> 9,050	<hr/> 1.8%



Respiratory tract 0.2%

Whole body 0.1%

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